Claims 2-10, 13, 16, 18-20, 71, 72, 74 and 75 stand rejected under 35 USC §103(a) as allegedly being unpatentable over GB 2 162 283 A (GB '283) in view of U.S. Patent Nos. 4,022,010 (Gladenbeck et al.). This rejection is respectfully traversed, and reconsideration is requested.

Independent claims 2, 4, 13 and 16 each recites a tension member, for providing lifting force to a car of an elevator system, the tension member interconnecting the car and a counterweight, the tension member being engageable with a rotatable traction sheave that is driven by a machine and over which the tension member passes so as to engage the traction sheave between take-up and take-off points on either side of the traction sheave. Independent claims 71, 72, 74 and 75 each recites an elevator system including a car, a counterweight, a traction sheave driven by a machine, and a tension member interconnecting the car and the counterweight. The tension member passes over the traction sheave, is engaged by the traction sheave between take-up and take-off points on either side of the traction sheave, and is driven by the traction sheave. In claims 2 and 71, the tension member includes a plurality of load carrying ropes. In claims 4 and 72, the tension member includes strands of non-metallic material. In claims 13, 16, 74 and 75, the tension member includes a load-carrying member. In each of these claims, the tension member has an aspect ratio (width to thickness) of greater than one. In each of these claims, the tension member also includes a polyurethane coating (which in claims 2 and 71 maintains separation of the individual ropes and resists longitudinal movement of the ropes relative to one another) and an engagement surface that receives force from the traction sheave as a result of traction between the engagement surface and a region of the traction sheave between the take-up and take-off points. The force is transmitted to the ropes/strands/load-carrying member of the tension member by the polyurethane coating to thereby move the car, and the engagement surface is defined on the polyurethane coating substantially by the width dimension of the tension member.

On the other hand, according to Applicants' understanding GB '283 does not disclose or suggest the claimed tension member engageable with a rotatable traction sheave or elevator system that includes a traction sheave and a tension member that passes over and is engaged and driven by the traction sheave. Rather, GB '283 is

understood to disclose a winding drum, with separate ropes (one winding while the other unwinds) for the elevator cage and counterweight.

In the art, the terms "traction drive" and "traction sheave" denote a drive in which lifting ropes are driven by friction with the sheave. See, for example, the definition of "traction drive lift" in the 1985 and 1998 versions of EN 81-1, the definition section of the European standards for elevator construction and installation, and the definition of "traction machine" in the 1971 and 1997 versions of A17.1c, from the US counterpart standard, excerpts attached as Appendix A. In contrast, a winding drum is well known in the art to be a positive drive mechanism, in which the ropes are driven by means other than friction. See, for example, the definitions of "positive drive lift (includes drum drive)" in EN 81-1 and "winding drum machine" in A17.1c.

In addition to the presentation in GB '283 of the disclosed double flat rope rotor winder as an improvement over the drum winder illustrated in Fig. 1 of GB '283, several other factors lead to the conclusion that GB '283 discloses a winding drum. Not only is each device repeatedly referred to as a "drum" (which in itself connotes a drum winder rather than a traction sheave), but the drums are disclosed as being clutched and geared or coupled together (page 1, line 44; page 2, lines 14-19). According to Applicants' understanding, this would indicate that the drums are being used to simultaneously wind cage and unwind counterweight ropes, or vice versa. In the arrangement shown in Figs. 4, 5 and 6 of GB '283, it is Applicants' understanding that each hoist comprises two coaxial drums, one each for the cage and counterweight ropes, which is consistent with the indication at lines 43-47 of page 2 that a minimum of two and a maximum of four motors would be required.

Thus, Applicants submit that GB '283 does not disclose or suggest at least the features recited in each of the independent claims regarding a tension member that interconnects the car and counterweight.

As a further indication that the disclosure relates to a drum winder, Fig. 2 of GB '283 shows high flanges at either end of the drum, which would seem to indicate that the rope would accumulate on the drum. Although the rope tracks 13 are not helical, according to Applicants' understanding a flat rope of any length could not be

accumulated helically, because the angle of wrap could not be reversed without kinking the rope. Thus, in order to wind a flat rope, the rope would stack on itself as it accumulated on the drum. Applicants note that the traditional rope winding drum shown in Fig. 1 of GB '283 also has flanges, although somewhat lower by comparison to Fig. 2 because the round rope will not be stacking directly on itself. In contrast, Applicants also note that Fig. 10 of GB 2134209 A (which is of record, and has the same assignee, inventor and agent as GB '283) shows no high end flanges. Although that figure does not show a traction sheave either, it does show a "Koepe" winder with toothed drive wheel on which the rope is not accumulated.

Applicants further believe that the disclosure in GB '283 that treads can be provided on *either or both* sides of the rope (e.g., page 2, line 29-33) also indicates that the arrangement is a winding drum. If the treads were provided for traction with the drum, the treads would only be beneficial on the side of the rope that contacts the drum. However, the treads are provided on either the drum-contact side, the opposite side, or both sides in order to increase the rope pressure, apparently to improve the rope's clamp on itself in stacked arrangement.

Additionally, Applicants again note the disclosure at page 2, lines 58-59, of GB '283 that grease is retained inside the rubber-like covering. Such an arrangement would completely undermine the rope's utility in a traction-drive arrangement, because it would destroy the torque capability between the covering and the rope. Thus, the arrangement in GB '283 would appear to require the end of the elevator-suspending rope be affixed to a drum on which the rope is wound. In any case, it seems clear that such a rope could not transmit the traction (between the traction sheave and the tension member in a region between the take-up and take-off points) through the polyurethane coating to the load carrying rope, which traction moves the car and counterweight. Thus, GB '283 also does not disclose or suggest at least such claimed features as a tension member interconnecting the car and the counterweight, passing over the traction sheave, being engaged by the traction sheave between take-up and take-off points on either side of the traction sheave, and being driven by the traction sheave, or such as a tension member that receives force from the traction sheave as a result of traction

between the engagement surface and a region of the traction sheave between the take-up and take-off points, which force is transmitted to the load-carrying member of the tension member by the polyurethane coating to thereby move the car.

Gladenbeck et al., which was cited for its disclosure regarding a polyurethane coating, is not read to overcome the above-noted deficiencies in the disclosure of GB '283. It does not appear to relate to a traction-drive elevator system, and does not suggest suitability for such a system, e.g., the required traction, wear, and load transmission characteristics. Rather, Gladenbeck et al. refers to rope storing and take-up drums (col. 3, line 45 and col.4, line 7). Accordingly, although Gladenbeck et al. refers to a polyurethane jacket, it neither discloses nor suggests the features set forth in each independent claim regarding an engagement surface--defined on the polyurethane coating--that receives force from the traction sheave as a result of traction between the engagement surface and a region of the traction sheave between take-up and take-off points, which force is transmitted to the ropes/strands/load-carrying member by the polyurethane coating to thereby move the car. Still further, it neither discloses nor suggests that the jacket maintains separation of the individual ropes and resists longitudinal motion of ropes relative to one another, in the manner set forth in claim 2. Therefore, even when the disclosures of these documents are considered in combination in the asserted manners, salient features of the claimed invention are not disclosed or suggested.

Accordingly, Applicants request withdrawal of each of the rejection of the independent claims based on §103.

The dependent claims recite features in addition to those set forth in the various independent claims, and are submitted to be allowable for the foregoing reasons and in their own right. Further independent consideration of the dependent claims is requested.

Provisional Double Patenting Rejection

Claims 2, 5, 6, 8-10, 13 and 18-20 stand provisionally rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 1,

12-15 and 20-22 of co-pending Application No. 09/218,990. Without conceding the propriety of this provisional rejection, in response:

(i) Applicants submit herewith a terminal disclaimer in compliance with 37 CFR 1.321(c); and

(ii) Applicants have authorized charging the terminal disclaimer fee under 37 CFR 1.20(d) ($110.00) to Deposit Account No. 15-0750, Order No. OT-4190.

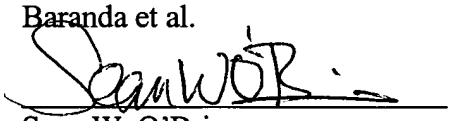
Accordingly, Applicants request withdrawal of the provisional double-patenting rejection.

Applicants submit this application to be in condition for allowance and request a notice thereof.

Please charge any additional fees or credit overpayment to Deposit Account No. 15-0750, Order No. OT-4190.

Respectfully submitted,

Baranda et al.



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BS 5655 : Part 1 : 1986
EN 81 : Part 1 : 1985
UDC 621.876.11-83:62-78:614.8

Lifts and service lifts

Part 1. Safety rules for the construction and installation of electric lifts

[EN title: Safety rules for the construction and installation of lifts and service lifts – Part 1: Electric lifts]

Ascenseurs et monte-charge
Partie 1. Règles de sécurité pour la construction et l'installation des ascenseurs électriques

Personen- und Lastenaufzüge sowie Kleingüteraufzüge
Teil 1. Sicherheitsregeln für die Konstruktion und den Einbau von elektrisch betriebenen Aufzügen

This European Standard EN 81 :.Part 1 has the status of a British Standard.

passenger (passager) (Fahrgast). Any person transported by a lift.

pit (cuvette) (Schachtgrube). The part of the well situated below the lowest landing level served by the car.

positive drive lift (includes drum drive) (ascenseur à treuil attelé) (Trommelaufzug, Kettenaufzug). A lift suspended by chains or lifting ropes driven by means other than friction.

positive drive service lift (includes drum drive) (monte-charge à treuil attelé) (Trommelaufzug/Kettenkleingüteraufzug). A service lift suspended by chains, or ropes driven by means other than friction.

progressive safety gear (parachute à prise amortie) (Bremsfangvorrichtung). A safety gear in which deceleration is effected by a braking action on the guides and for which special provisions are made so as to limit the forces on the car or counterweight to a permissible value.

pulley room (local des poulies) (Rollenraum). A room not containing the machine, and in which pulleys are located and in which the overspeed governors and the electrical equipment may also be housed.

rated load (charge nominale) (Nennlast). The load for which the equipment has been built and for which normal operation is guaranteed by the vendor.

rated speed (vitesse nominale) (Nenngeschwindigkeit). The speed of the car for which the equipment has been built and for which normal operation is guaranteed by the vendor.

re-levelling (isonivelage) (Nachstellung). An operation, after the lift has stopped, to permit the stopping position to be corrected during loading or unloading, if necessary by successive movements (automatic or inching).

safety gear (parachute) (Fangvorrichtung). A mechanical drive for stopping, and maintaining stationary on the guides, the lift car or counterweight in case of overspeeding in the downward direction or breaking of the suspension.

safety rope (câble de sécurité) (Sicherheitsseil). An auxiliary rope attached to the car and the counterweight for the purpose of tripping a safety gear in case of suspension failure.

service lift (monte-charge) (Kleingüteraufzug). A permanent lifting equipment serving defined landing levels, comprising a car, the interior of which is *inaccessible to persons* on account of its dimensions and means of construction, running at least partially between rigid vertical guides or guides whose inclination to the vertical is less than 15 °.

To satisfy the condition of inaccessibility, the car dimensions do not exceed:

(a) floor area 1.00 m^2;
(b) depth 1.00 m;
(c) height 1.20 m.

A height greater than 1.20 m is permissible, however, if the car comprises several permanent compartments, each of which satisfies the above requirements.

sling (étrier) (Rahmen). The metal framework carrying the car or counterweight, connected to the means of suspension. This sling may be integral with the car enclosure.

toe guard (garde-pieds) (Schürze). An apron having a smooth vertical part extending downwards from the sill of the landing or car entrance.

traction drive lift (ascenseur à adhérance) (Treibscheiben-Aufzug). A lift whose lifting ropes are driven by friction in the grooves of the driving sheave of the machine.

traction drive service lift (monte-charge à adhérence) (Treibscheiben-Kleingüteraufzug). A service lift whose lifting ropes are driven by friction in the grooves of the driving sheave of the machine.

unlocking zone (zone de déverrouillage) (Entriegelungszone). A zone, extending above and below the stopping level, in which the car floor must be to enable the corresponding landing door to be unlocked.

user (usager) (Benutzer). Person making use of the services of a lift installation.

well (gaine) (Schacht). The space in which the car and the counterweight, if there is one, travels. This space is bounded by the bottom of the pit, the walls and the roof of the well.

4. Symbols and abbreviations

4.1 Units. The units used are chosen from the International (SI) System of units.

4.2 Symbols

Measurements (in the order they appear in the document)	Symbol	Unit
Rated speed	v	m/s
Sum of the mass of the empty car and the masses of the portion of the travelling cables and any compensation devices, suspended from the car	P	kg
Rated load (mass)	Q	kg
Ratio between the greater and the smaller static force in the parts of the rope located on either side of the traction sheave	$\frac{T_1}{T_2}$	(1)
Coefficient taking account of the acceleration, deceleration and specific conditions of the installation	C_1	(1)
Standard acceleration of free fall	g_n	m/s^2
Braking deceleration of the car	a	m/s^2
Coefficient taking account of the variation in profile of the traction sheave groove due to wear	C_2	(1)
Base of natural logarithms	e	(1)
Coefficient of friction of ropes in traction sheave grooves	f	(1)
Coefficient of friction between steel wire ropes and sheaves	μ	(1)
Angle of wrap of the ropes on the traction sheave	α	rad
Angle of the undercut grooves or semi-circular grooves in the traction sheave	β	rad
Angle of the vee grooves in the traction sheave	γ	rad
Diameter of traction ropes	d	mm
Diameter of traction sheave	D	mm
Number of ropes	n	(1)
Specific pressure of the ropes in the traction sheave grooves	p	N/mm^2
Static force in the ropes to the car at the level of the traction sheave when the car is stationary at the lowest level with its rated load	T	N
Speed of the ropes corresponding to the rated speed of the car	v_0	m/s

guide rails (*guides*) (*Führungsschienen*). The rigid components which provide guiding for the car, the counterweight or the balancing weight.

headroom (*partie supérieure de la gaine*) (*Schachtkopf*) : Part of the well between the highest landing served by the car and the ceiling of the well.

instantaneous safety gear (*parachute à prise instantanée*) (*Sperrfangvorrichtung*) : A safety gear in which the full gripping action on the guide rails is almost immediate.

instantaneous safety gear with buffered effect (*parachute à prise instantanée avec effet amorti*) (*Sperrfangvorrichtung mit Dämpfung*) : A safety gear in which the full gripping action on the guide rails is almost immediate, but the reaction on the car, counterweight or balancing weight is limited by presence of an intermediate buffering system.

laminated glass (*verre feuilleté*) (*Verbundsicherheitsglas VSG*) : An assembly of 2 or more glass layers, each of which is bonded together using a plastic film.

levelling (*nivelage*) (*Einfahren*) : An operation which improves the accuracy of stopping at landings.

lift machine (*machine*) (*Triebwerk*) : The unit including the motor which drives and stops the lift.

machine room (*local de machines*) (*Triebwerksraum*) : A room in which machine or machines and/or the associated equipment are placed.

minimum breaking load of a rope (*charge de rupture minimale d'un câble*) (*Mindestbruchkraft eines Seiles*) : The product of the square of the nominal diameter of the rope (in square millimetres) and the nominal tensile strength of the wires (in newtons per square millimetre) and a coefficient appropriate to the type of rope construction.

overspeed governor (*limiteur de vitesse*) (*Geschwindigkeitsbegrenzer*) : A device which, when the lift attains a predetermined speed, causes the lift to stop, and if necessary causes the safety gear to be applied.

passenger (*passager*) (*Fahrgast*) : Any person transported by a lift in the car.

pit (*cuvette*) (*Schachtgrube*) : The part of the well situated below the lowest landing served by the car.

positive drive lift (includes drum drive) (*ascenseur à treuil ettelé*) (*Trommelaufzug, Kettenaufzug*) : A lift suspended by chains or ropes driven by means other than friction.

progressive safety gear (*parachute à prise amortie*) (*Bremsfangvorrichtung*) : A safety gear in which retardation is effected by a braking action on the guide rails and for which special provisions are made so as to limit the forces on the car, counterweight or balancing weight to a permissible value.

pulley room (*local de poulies*) (*Rollenraum*) : A room not containing the machine, in which pulleys are located, and in which the overspeed governor and the electrical equipment can also be housed.

rated load (*charge nominale*) (*Nennlast*) : The load for which the equipment has been built.

rated speed (*vitesse nominale*) (*Nenngeschwindigkeit*) : The speed v in metres per second of the car for which the equipment has been built.

re-levelling (*isonivelage*) (*Nachstellen*) : An operation, after the lift has stopped, to permit the stopping position to be corrected during loading or unloading, if necessary by successive movements (automatic or inching).

safety gear (*parachute*) (*Fangvorrichtung*) : A mechanical device for stopping, and maintaining stationary on the guide rails, the lift car, counterweight or balancing weight in case of overspeeding or breaking of the suspension.

safety rope (*câble de sécurité*) (*Sicherheitsseil*) : An auxiliary rope attached to the car, the counterweight or balancing weight for the purpose of tripping a safety gear in case of suspension failure.

sling (*étrier*) (*Rahmen*) : The metal framework carrying the car, counterweight or balancing weight, connected to the means of suspension. This sling can be integral with the car enclosure.

traction drive lift (*ascenseur à adhérence*) (*Treibscheiben-Aufzug*) : A lift whose lifting ropes are driven by friction in the grooves of the driving sheave of the machine.

travelling cable (*câble pendentif*) (*Hängekabel*) : Flexible cable between the car and a fixed point.

unlocking zone (*zone de déverrouillage*) (*Entriegelungszone*) : A zone, extending above and below the stopping level, in which the car floor must be to enable the corresponding landing door to be unlocked.

user (*usager*) (*Benutzer*) : Person making use of the services of a lift installation.

well (*gaine*) (*Schacht*) : The space in which the car, the counterweight or the balancing weight travels. This space is usually bounded by the bottom of the pit, the walls and the ceiling of the well.

AMERICAN NATIONAL STANDARD
SAFETY CODE FOR

Elevators, Dumbwaiters, Escalators and Moving Walks

Includes:
ANSI A17.1a–1972
ANSI A17.1b–1973
ANSI A17.1c–1974
ANSI A17.1d–1975
ANSI A17.1e–1975
ANSI A17.1f–1975
ANSI A17.1g–1976

Covering their design, construction, installation, operation, inspection, testing, maintenance, alteration and repair

ANSI A17.1-1971

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Leveling Device, Two-Way Automatic Non-Maintaining. A device which corrects the car level on both under-run and over-run, but will not maintain the level during loading and unloading.

Leveling Zone. The limited distance above or below an elevator landing within which the leveling device is permitted to cause movement of the car toward the landing.

Machine, Driving. The power unit which applies the energy necessary to raise and lower an elevator or dumbwaiter car or to drive an escalator, a private residence inclined lift or a moving walk.

Electric Driving Machine. One where the energy is applied by an electric motor. It includes the motor and brake and the driving sheave or drum together with its connecting gearing, belt or chain if any.

Direct-Drive Machine. An electric driving machine the motor of which is directly connected mechanically to the driving sheave, drum, or shaft without the use of belts or chains either with or without intermediate gears.

Geared-Drive Machine. A direct-drive machine in which the energy is transmitted from the motor to the driving sheave, drum, or shaft through gearing.

Traction Machine. A direct-drive machine in which the motion of a car is obtained through friction between the suspension ropes and a traction sheave.

Geared-Traction Machine. A geared-drive traction machine.

Gearless-Traction Machine. A traction machine, without intermediate gearing, which has the traction sheave and the brake drum mounted directly on the motor shaft.

Winding-Drum Machine. A geared-drive machine in which the hoisting ropes are fastened to and wind on a drum.

Worm-Geared Machine. A direct-drive machine in which the energy from the motor is transmitted to the driving sheave or drum through worm gearing.

Indirect-Drive Machine. An electric driving machine, the motor of which is connected indirectly to the driving sheave, drum or shaft by means of a belt or chain through intermediate gears.

Belt-Drive Machine. An indirect-drive machine having a single belt or multiple belts as the connecting means.

Chain-Drive Machine. An indirect-drive machine having a chain as the connecting means.

Hydraulic Driving Machine. One in which the energy is applied by means of a liquid under pressure in a cylinder equipped with a plunger or piston.

Direct-Plunger Driving Machine. One in which the energy is applied by a plunger or piston directly attached to the car frame or platform and which operates in a cylinder under hydraulic pressure. It includes the cylinder and plunger or piston.

Roped-Hydraulic Driving Machine. One in which the energy is applied by a piston, connected to the car with wire ropes, which operates in a cylinder under hydraulic pressure. It includes the cylinder, the piston, and multiplying sheaves if any and their guides.

Screw Machine. An electric driving machine, the motor of which raises and lowers a vertical screw through a nut, with or without suitable gearing, and in which the upper end of the screw is connected directly to the car frame or platform. The machine may be of direct or indirect drive type.

May. The term "may" where used shall be construed as permissive.

Moving Walk. A type of passenger-carrying device on which passengers stand or walk, and in which the passenger-carrying surface remains parallel to its direction of motion and is uninterrupted.

Moving Walk, Belt Type. A moving walk with a power-driven continuous belt treadway.

Moving Walk, Belt Pallet Type. A moving walk with a series of connected and power-driven pallets to which a continuous belt treadway is fastened.

Moving Walk, Pallet Type. A moving walk with a series of connected and power-driven pallets which together constitute the treadway.

Moving Walk, Edge Supported Belt Type. A moving walk with the treadway supported near its edges by a succession of rollers.

Moving Walk, Roller Bed Type. A moving walk with the treadway supported throughout its width by a succession of rollers.

Moving Walk, Slider-Bed Type. A moving walk with the treadway sliding upon a supporting surface.

Moving Walk System. A series of moving walks in end to end or side by side relationship with no landings between treadways.

Non-Stop Switch, Elevator. A switch, which when operated, will prevent the elevator from making registered landing stops.

Operating Device. The car switch, push button, lever or other manual device used to actuate the control.

Operation. The method of actuating the control.

Operation, Automatic. Operation wherein the starting of the elevator car is effected in response to the momentary actuation of

hoistway-door locking device which permits egress from the hoistway side

landing, top terminal — the highest landing served by the elevator or material lift which is equipped with a hoistway door provided with a hoistway-door locking device which permits egress from the hoistway side

landing, unenclosed — a landing which is open to the atmosphere or is open to an interior court of a building

landing, escalator or moving walk — the stationary area at the entrance to or exit from an escalator, a moving walk, or moving walk system

landing zone — a zone extending from a point 18 in. (457 mm) below an elevator or material lift landing to a point 18 in. (457 mm) above the landing

leveling — controlled car movement toward the landing, within the leveling zone, by means of a leveling device, which vertically aligns the car-platform sill relative to the hoistway-landing sill to attain a predetermined accuracy

leveling device, elevator car — any mechanism which will, either automatically or under the control of the attendant, move the car within the leveling zone toward the landing only, and automatically stop it at the landing

NOTES (leveling device, elevator car):
(1) Where controlled by the attendant by means of up-and-down continuous-pressure switches in the car, this device is known as an "inching device."
(2) Where used with a hydraulic elevator to correct automatically a change in car level caused by leakage in the hydraulic system, this device is known as an "anti-creep device."

leveling device, one-way automatic — a device which corrects the car level only in case of under-run of the car, but will not maintain the level during loading and unloading

leveling device, two-way automatic maintaining — a device which corrects the car level on both under-run and over-run, and maintains the level during loading and unloading

leveling device, two-way automatic nonmaintaining — a device which corrects the car level on both under-run and over-run, but will not maintain the level during loading and unloading

leveling zone — the limited distance above or below an elevator or material lift landing within which the leveling device is permitted to cause movement of the car toward the landing

listed — equipment or materials included in a list published by an independent certifying organization concerned with product evaluation that maintains periodic inspection of production of listed equipment or materials and whose listing states whether that equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner

NOTE (listed): The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction utilizes the system employed by the listing organization to identify a listed product.

machine, driving — the power unit which applies the energy necessary to drive an elevator or other equipment covered by the scope of this Code

electric driving machine — one where the energy is applied by an electric motor. It includes the motor, brake, and the driving sheave or drum together with its connecting gearing, belt, or chain, if any.

direct-drive machine — an electric driving machine, the motor of which is directly connected mechanically to the driving sheave, drum, or shaft without the use of belts or chains, either with or without intermediate gears

geared-drive machine — a direct-drive machine in which the energy is transmitted from the motor to the driving sheave, drum, or shaft through gearing

winding drum machine — a geared-drive machine in which the suspension ropes are fastened to and wind on a drum

traction machine — a direct-drive machine in which the motion of a car is obtained through friction between the suspension ropes and a traction sheave

geared-traction machine — a geared-drive traction machine

gearless-traction machine — a traction machine, without intermediate gearing, which has the traction sheave and the brake drum mounted directly on the motor shaft

worm-geared machine — a direct-drive machine in which the energy from the motor is transmitted to the driving sheave or drum through worm gearing

indirect-drive machine — an electric driving machine, the motor of which is connected indirectly to the driving sheave, drum, gear reducer, or shaft by means of a belt drive or chain drive

belt-drive machine — an indirect-drive machine equipped with a belt system as the connecting means

chain-drive machine — an indirect-drive machine with a chain system as the connecting means

rack and pinion driving machine — an electric driving machine in which the motion of the car is obtained by power-driven rotating pinion(s) mounted on the car, traveling on a stationary rack mounted in the hoistway